Subject: MSD Colloquium, Prof. Susan Trolier-McKinstry, The Pennsylvania State University, Domain Wall Contributions to the Properties of Piezoelectric Thin Films, Thursday, May 8, 2008, 11:00 a.m., Building 212, Room A-157, Serge Nakhmanson
From: Marlene Metz <metz@anl.gov>
Date: Thu, 17 Apr 2008 16:13:26 -0500
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MATERIALS SCIENCE COLLOQUIUM

SPEAKER: Prof. Susan Trolier-McKinstry
The Pennsylvania State University

TITLE: "Domain Wall Contributions to the Properties of Piezoelectric Thin Films"

DATE: Thursday, May 8, 2008

TIME: 11:00 a.m.

PLACE: Building 212, Room A-157

HOST: Serge Nakhmanson

Refreshments will be available at 10:45 a.m

Abstract:

In homogeneous bulk ceramics, extrinsic contributions associated with motion of domain walls and phase boundaries are a significant component of the measured dielectric and piezoelectric response. In the doped BaTiO3 materials used in multilayer capacitors, domain wall motion is still important, but the potential energy profile through which the domain walls move appears to be more complicated. In thin films, the small grain sizes, substantial residual stresses, and the high concentration of point and line defects change the relative mobility of the boundaries. One of the consequences of this is that thin films typically act as hard piezoelectrics. This talk will review the literature in this field, emphasizing the difference between the nonlinearities observed in the dielectric and piezoelectric properties of films. The effect of ac field excitation levels, dc bias fields, temperature, and applied mechanical stress are discussed.
